IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants:	Faisal Haq; Hari K. Lalgudi
Assignee:	Cisco Technology, Inc.
Title:	Implementing Access Control Lists Using A Balanced Hash Table of Access Control List Binary Comparison Trees

Serial No.:	09/483,110	Filing Date:	January 14, 2000
Examiner:	Frank Doung	Group Art Unit:	2666
Docket No.:	CIS0046US		

Austin, Texas
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PRE-APPEAL BRIEF REQUEST FOR REVIEW

Dear Sir:

Applicants hereby request review of the final rejection, mailed August 23, 2005, in the above-identified application. This Request is being filed concurrently with a Notice of Appeal. No amendments are being filed with this request.

This review is requested for the reasons set forth in the Remarks section, which begins on page 2 of this document.

REMARKS

Claims 1-64 are pending in the application.

Claims 1-6, 16-21 and 31-43 and 52-57 stand rejected.

Claims 7-15, 22-30, 44-51 and 58-64 are objected to.

Rejection of Claims under 35 U.S.C. § 102

Claims 1-6, 16-21, 31-43 and 52-57 stand rejected under 35 U.S.C. § 102(b), as being anticipated by Dobbins, et al., U.S. Patent No. 5,509,123. Applicants assert that the Final Office Action mailed August 23, 2005 (hereinafter referred to as the "Final Office Action") has not established that claim 1 is anticipated by Dobbins.

Claim 1 recites:

> A method comprising:
> receiving at least one packet; and
> disposing of the received at least one packet in response to a walk of a
>   Hash Table, wherein
> the Hash Table is balanced,
> the Hash Table is configured to store Binary Comparison Trees, and
> the Hash Table is configured to encode an Access Control List.

"A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegall Bros. V. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). The Examiner states that either the cache or the AVL tree taught in Dobbins anticipate the "Hash Table" recited in claim 1. Final Office Action, page 2. Applicants note that neither the cache nor the AVL tree anticipate the "Hash Table" recited in claim 1.

Dobbins provides "an object-oriented architecture for network layer routing." Dobbins, Abstract. In this architecture, which "utilizes distributed autonomous forwarding engines," "each interface 11, 14, 17 has a forwarding engine 12, 15, 18 sitting above it, and each forwarding engine knows how to receive and transmit packets on its own interface." Dobbins, col. 7, lines 31-36. Several sections (particularly sections B.2 and B.3) of Dobbins describe these distributed forwarding engines.

In section B.3, Dobbins describes how the access list is implemented in the AVL tree (which is cited by the Examiner as teaching the "Hash Table" of claim 1): "To provide an object-oriented, powerful and very efficient access control mechanism, a base class FAC

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(Forwarding Access) was invented. For efficiency, FAC keeps access list entries as nodes in an AVL tree. A tree does not have a predefined size and may grow freely." Dobbins, col. 11, lines 9-13.

In section B.2, Dobbins describes how each forwarding engine contains a cache (also cited as anticipating the "Hash Table" of claim 1). Dobbins states that: "Performance-sensitive code often employs caching to speed up performance. Typically, hash codes are used to speed retrieval of the hashed data." Dobbins, col. 9, lines 31-33. "As part of the forwarding process, the IP forwarding engine methods (1) validate packet addresses, (2) filter against an access list, and (3) retrieve the next hop from the FIB. These procedures are inherently slow, so the results of these procedures once obtained, such as address validity, are cached and corresponding procedures are provided in IPACache to lookup the same results quickly." Dobbins, col. 10, lines 22-28.

Thus, Dobbins describes a system in which a forwarding engine can access an access list, implemented as an AVL tree, to determine how to filter a packet. Once a filtering decision is made, the forwarding engine can store the result of the filtering procedure in a cache, which can subsequently be accessed using a hash code. Applicants note that in the system taught in Dobbins, the information stored in the cache is a single result (e.g., "permit" or "deny"; See Dobbins, col. 10, lines 38-41), obtained by accessing an access list, and is not an access list itself. Thus, the cache of Dobbins does not anticipate, teach, or suggest a Hash Table that is configured to encode an Access Control List, as recited in claim 1.

While the AVL tree taught in Dobbins does implement an access control list, the AVL tree taught in Dobbins is clearly not a hash table. Accordingly, this element of Dobbins also does not teach or suggest a hash table configured to encode an access control list.

Furthermore, it is noted that the system taught in Dobbins stores the results of accessing an AVL tree, not binary comparison trees themselves, in the cache. Accordingly, the cache taught in Dobbins does not anticipate, teach, or suggest a hash table that is configured to store binary comparison trees, as recited in claim 1.

The Examiner states that the AVL tree taught in Dobbins anticipates the "balanced" hash table of claim 1, since "the AVL tree is inherently balanced." Office Action, p. 2. As noted above, the AVL tree is not a hash table, and thus cannot anticipate this feature of claim 1. Furthermore, the mere statement that a tree "does not have a predefined size and may grow freely" does not provide any information about whether a hash table is balanced. Thus, Dobbins also does not teach or suggest a hash table that is balanced.

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For at least the foregoing reasons, claim 1 is patentable over the cited art. Claims 2-6 are also patentable for at least these reasons. Claims 16-21, 31-43 and 52-57 are patentable for reasons similar to the foregoing reasons provided above with respect to claim 1.

Allowable Claims

Claims 7-15, 22-30, and 44-51 and 58-64 were objected to as being dependent upon a rejected base claim, but indicated as being allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Applicants assert that claims 7-15, 22-30, and 44-51 and 58-64 depend from patentable base claims and are therefore patentable.

CONCLUSION

Applicants assert that the application is in condition for allowance and respectfully request that a finding withdrawing the final rejection of the claims be issued.

I hereby certify that this correspondence is being deposited with the United States Postal Service as First Class Mail in an envelope addressed to: Mail Stop AF, Commissioner for Patents, P. O. Box 1450, Alexandria, VA 22313-1450, on <u>December 22, 2005</u>. *Brenna A Brock*   12/22/05 Attorney for Applicant(s)   Date of Signature

Respectfully submitted,

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